

Attorney Docket No. P69665US0  
Application No. 10/824,645

**Amendments to the claims:**

This listing of claims replaces all prior versions, and listings, of claims in the application.

**Listing of claims:**

- 1 (currently amended): A method of manufacturing a deodorant including the steps of:
- forming polymer particles by reacting a main monomer of (N-substituted alkyl)acrylamide, a functional monomer for bonding the polymer particles to a fibrous substrate, a cross-linking agent, and an initiator and
  - loading a deodorant agent to the polymer particles,
- wherein the polymer particles have a lower critical solution temperature and the polymer particles are formed at a temperature above the lower critical solution temperature.
- wherein the deodorant agent is selected from the group consisting of C18:1 dioic acid, C18:2 dioic acid, and phenyl compounds,
- wherein the cross-linking agent is selected from the group consisting of 2-(diethylamino)ethyl acrylate, 2-(dimethylamino)ethyl acrylate, 2-(dimethylamino)ethyl methacrylate, 2-(diethylamino)ethyl methacrylate, and N,N'-methylenebisacrylamide (BisAAM), and
- wherein the main monomer is present at an amount of 80% to 90% by weight of the polymer particles, the functional monomer is present at an amount of 5% to 15% by weight of the polymer

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particles, and the cross-linking agent is present at an amount of 1% to 10% by weight of the polymer particles.

- 2 (previously presented): The method of Claim 1, wherein the main monomer is selected from the group consisting of N-isopropyl acrylamide, N-methylacrylamide, N-ethylacrylamide, N-n-butylacrylamide, N-n-propylacrylamide, N-n-propylmethacrylamide, N-isopropylmethacrylamide, N-ethylmethacrylamide, N-acroylpiperidine, N-methacroylpiperidine, N-pyrrolidylmethacrylamide, N-piperidylmethacrylamide, and N,N'-diethylacrylamide, and N-isopropylacrylamide.

Claim 3 (cancelled).

- 4 (previously presented): The method of Claim 1, wherein the functional monomer is selected from the group consisting of acrylamide, allyl alcohol, n-(isobutoxymethyl)acrylamide, N-(isobutoxymethyl)methacrylamide, m and p-vinylbenzyl alcohol, cyanomethyl methacrylate, 2-poly(ethyleneoxy)ethyl acrylate, methacryloyloxypolyglycerol, glyceryl methacrylate, 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate, 2-hydroxypropyl methacrylate, N-vinyl-2-pyrrolidone, p-aminostyrene, aconitic acid, acrylic acid, methacrylic acid, fumaric acid, itaconic acid, maleic acid, 2-methacryloyloxyethylsulfuric acid, sodium salt, pyridinium 2-methacryloyloxyethylsulfate, 3-acrylamidopropane-1-sulfonic acid, potassium salt, p-

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styrenesulfonic acid, sodium salt, 3-methacryloyloxypropane-1-sulfonic acid sodium salt, 2-acrylamido-2-methylpropanesulfonic acid, methacrylic acid, lithium methacrylate, 2-methacryloyloxyethyl 1 sulfonic acid ammonium p-styrenesulfonate, sodium o and p-styrenesulfonate, N-(3-acrylamidopropyl)ammonium methacrylate, N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium iodide, N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium p-toluenesulfonate, 1,2-dimethyl-5-vinylpyridinium methosulfate, N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium bromide, N,N-trimethylammonium fluoride, N-vinylbenzyl-N,N,N-trimethylammonium chloride, 3-methyl-1-vinylimidazolium methosulfate, N-(3-methacrylamidopropyl)-N-benzyl-N,N-dimethylammonium chloride, and N-(3-methacrylamidopropyl)-N,N,N-trimethylammonium chloride.

Claims 5 -8 (cancelled).

9 (previously presented): The method of Claim 1, wherein the polymer particles are attached to the fibrous substrate by hydrogen-bond.

10 (previously presented): The method of Claim 1, wherein the polymer particles are attached to the fibrous substrate by a binding agent.

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11 (previously presented): The method of Claim 10, wherein the binding agent is selected from the group consisting of polyglycols, polycarboxylic acids, polycarboxylates, poly(lactone)s polyols, polyamides, polyamines, polysulfonic acids, polysulfonates, gamma-aminopropyltrialkoxysilanes, gamma-isocyanatopropyltriethoxysilane, vinyl-trialkoxysilanes, glycidoxypropyltrialkoxysilanes, glutaraldehyde, and ureidopropyltrialkoxysilanes.

Claim 12 (cancelled).

13 (previously presented): The method of Claim 1, wherein the phenyl compound is selected from the group consisting of phenyl alcohols, phenyl acids, and phenyl esters.

14 (previously presented): The method of Claim 13, wherein the phenyl alcohols are selected from the group consisting of benzyl alcohol, 2-hydroxybenzyl alcohol, 2,3-dimethoxybenzyl alcohol, t-butylhydroquinone, pyrocatechol, and 2-amino-4-nitrophenol.

15 (previously presented): The method of Claim 13, wherein the phenyl acids are selected from the group consisting of gallic acid, benzoic acid, salicylic acid and ferulic acid.

16 (previously presented): The method of Claim 13, wherein the phenyl esters are selected from the group consisting of benzyl cinnamate, monoterpene derivatives including geranic acid, sterols

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including cholesterol, and ergosterol, steroids including testosterone, and androstenedione, flavonoids including naringenin, isosakuranetin, eriodictyol, and genistein, steryl esters including amyirin cinnamate, 2,7-naphthalenediol, oxyquinoline, and cyclodextrins and their derivatives thereof.

17 (previously presented): The method of Claim 1, wherein the deodorant agent is loaded during synthesis of the polymer particles.

18 (previously presented): The method of Claim 1, wherein the deodorant agent is loaded by hydrophobic interaction with the polymer particles.

19 (previously presented): The method of Claim 1, wherein the initiator is selected from the group consisting of persulfates, peroxides, azo-contained compounds and redox initiators.

20 (new): A method of manufacturing a deodorant including the steps of:

- forming polymer particles by reacting a main monomer of (N-substituted alkyl)acrylamido, a functional monomer for bonding the polymer particles to a fibrous substrate, a cross linking agent, an initiator, and a surface-active substance and
- loading a deodorant agent to the polymer particles,

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wherein the deodorant agent is selected from the group consisting of C18:1 dioic acid, C18:2 dioic acid, and phenyl compounds,

wherein the cross-linking agent is selected from the group consisting of 2-(diethylamino)ethyl acrylate, 2-(dimethylamino)ethyl acrylate, 2-(dimethylamino)ethyl methacrylate, 2-(diethylamino)ethyl methacrylate, and N,N'-methylenebisacrylamide (BisAAM), and

wherein the main monomer is present at an amount of 80% to 90% by weight of the polymer particles, the functional monomer is present at an amount of 5% to 15% by weight of the polymer particles, and the cross-linking agent is present at an amount of 1% to 10% by weight of the polymer particles.

21 (new): The method of Claim 20, wherein the main monomer is selected from the group consisting of N-isopropyl acrylamido, N-methylacrylamide, N-ethylacrylamide, N-n-butylacrylamide, N-n-propylacrylamide, N-n-propylmethacrylamide, N-isopropylmethacrylamide, N-ethylmethacrylamide, N-acroylpiperidine, N-methacroylpiperidine, N-pyrrolidylmethacrylamide, N-piperidylmethacrylamide, and N,N'-diethylacrylamide, and N-isopropylacrylamide.

22 (new): The method of Claim 20, wherein the functional monomer is selected from the group consisting of acrylamido, allyl alcohol, n-(isobutoxymethyl)acrylamido, N-(isobutoxymethyl)methacrylamide, m and p-vinylbenzyl alcohol, cyanomethyl methacrylate, 2-

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poly(ethyleneoxy)ethyl acrylate, methacryloyloxypolyglycerol, glyceryl methacrylate, 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate, 2-hydroxypropyl methacrylate, N-vinyl-2-pyrrolidone, p-aminostyrene, aconitic acid, acrylic acid, methacrylic acid, fumaric acid, itaconic acid, maleic acid, 2-methacryloyloxyethylsulfuric acid, sodium salt, pyridinium 2-methacryloyloxyethylsulfate, 3-acrylamidopropane-1-sulfonic acid, potassium salt, p-styrenesulfonic acid, sodium salt, 3-methacryloyloxypropane-1-sulfonic acid, sodium salt, 2-acrylamido-2-methylpropanesulfonic acid, methacrylic acid, lithium methacrylate, 2-methacryloyloxyethyl 1 sulfonic acid ammonium p-styrenesulfonate, sodium o and p-styrenesulfonate, N-(3-acrylamidopropyl)ammonium methacrylate, N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium iodide, N-(2-dimethyl-5-vinylpyridinium methosulfate, N-(2-methacryloyloxyethyl)-N,N,N-trimethylammonium bromide, N,N,N-trimethylammonium fluoride, N-vinylbenzyl-N,N,N-trimethylammonium chloride, 3-methyl-1-vinylimidazolium methosulfate, N-(3-methacrylamidopropyl)-benzyl-N,N-dimethylammonium chloride, and N-(3-methacrylamidopropyl)-N,N,N-trimethylammonium chloride.

23 (new): The method of Claim 20, wherein the polymer particles are attached to the fibrous substrate by hydrogen-bond.

24 (new): The method of Claim 20, wherein the polymer particles are attached to the fibrous substrate by a binding agent.

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25 (new): The method of Claim 24, wherein the binding agent is selected from the group consisting of polyglycols, polycarboxylic acids, polycarboxylates, poly(lactone)s polyols, polyamides, polyamines, polysulfonic acids, polysulfonates, gamma-aminopropyltrialkoxysilanes, gamma-isocyanatopropyltriethoxysilane, vinyl-trialkoxysilanes, glycidoxypropyltrialkoxysilanes, glutaraldehyde and ureidopropyltrialkoxysilanes.

26 (new): The method of Claim 20, wherein the phenyl compound is selected from the group consisting of phenyl alcohols, phenyl acids, and phenyl esters.

27 (new): The method of Claim 26, wherein the phenyl alcohols are selected from the group consisting of benzyl alcohol, 2-hydroxy benzyl alcohol, 2,3-dimethoxybenzyl alcohol, t-butylhydroquinone, pyrocatechol, and 2-amino-4-nitrophenol.

28 (new): The method of Claim 26, wherein the phenyl acids are selected from the group consisting of gallic acid, benzoic acid, salicylic acid and ferulic acid.

29 (new): The method of Claim 26, wherein the phenyl esters are selected from the group consisting of benzyl cinnamate, monoterpene derivatives including geranic acid, sterols including cholesterol and ergosterol, steroids including testosterone, and androstenedione, flavonoids including



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naringenin, isosakuranetin, eriodictyol, and genistein, steryl esters including amyirin cinnamate, 2,7-naphthalenediol, oxyquinoline, and cyclodextrins and their derivatives thereof.

30 (new): The method of Claim 20, wherein the deodorant agent is loaded during synthesis of the polymer particles.

31 (new): The method of Claim 20, wherein the deodorant agent is loaded by hydrophobic interaction with the polymer particles.

32 (new): The method of Claim 20, wherein the initiator is selected from the group consisting of persulfates, peroxides, azo-contained compounds and redox initiators.